

Tobacco Surveillance Report

July 2007

FAMILY CORRELATES OF YOUTH SMOKING BEHAVIOR AND ATTITUDES PNA 2006

Recent longitudinal studies of smoking initiation among youth at the Fred Hutchinson Cancer Research Center show that parental smoking, sibling smoking, and lack of parental anti-smoking behaviors (including lack of rules about smoking in the home) are predictors of youth smoking initiation.¹ Elsewhere, a longitudinal study reported that parental disapproval of children smoking is not itself sufficient to prevent youth initiation, particularly if parents smoke or if family connectedness is low.² In contrast, another large longitudinal study found that students who perceive strong parental disapproval are less likely to begin smoking and less likely to become established smokers, although the effect of parental disapproval is modified by parental and sibling smoking.³ A national study found that lack of family discussions and lack of rules about smoking are risk factors for youth smoking.⁴ A number of studies have found that having friends who smoke is a risk factor for smoking initiation, although it appears that both peer pressure to adopt friends' smoking behavior and selection of friends based on one's own smoking status are involved.⁵ The largest and most comprehensive longitudinal study, at Hutchinson, suggests that familial and peer influences interact in predicting risk of youth smoking.⁶

The Prevention Needs Assessment (PNA) community survey is conducted in Montana schools every other year. It is distributed to all 8th, 10th, and 12th grade classrooms in schools that choose to participate. In 2006, more than 22,000 students from 153 of Montana's 231 middle and high schools participated, or 53% of the 8th, 10th, and 12th grade enrollment of the state. Completed surveys were evaluated on the basis of three dishonesty indicators, resulting in exclusion of ten percent of the surveys. Half of the sample was asked additional questions about tobacco beliefs and attitudes. The final sample for this report is 12,564 students with complete data for all items included.

The tobacco questions included:

- How wrong do your parents feel it would be for you to smoke cigarettes?
- Does your family have clear rules about cigarettes and tobacco use?
- Have any of your brothers or sisters ever smoked cigarettes?
- Not counting yourself, does anyone who lives in your home smoke cigarettes?
- How wrong do you think it is for someone your age to smoke cigarettes?
- What are the chances you would be seen as cool if you smoked cigarettes?
- How many of your four best friends smoke cigarettes?

The PNA also collects limited demographic information about parents, including the highest level of education completed by either parent. It does not collect information on parental smoking, except indirectly through the question about other household members smoking.

¹ Rajan et al., 2003, *J Adolesc Health* 33:25-30; Andersen et al., 2004, *Arch Pediatr Adolesc Med* 158:348-352; Bricker et al., 2006, *Addiction* 101:128-136.

² Tilson et al., 2004, *J Adolesc Health* 35:182-189.

³ Sargent and Dalton, 2001, *Pediatrics* 108:1256-1262.

⁴ Brown et al., 2006, *J Prim Prev* 27:515-526.

⁵ Bricker et al., 2006, *Addict Behav* 31:889-900; Arnett, 2006, *Health Educ Behav*, epub; Hoffman et al., 2006, *Addict Behav* 41:103-155;

⁶ Bricker et al., 2006, *Nicotine Tob Res* 8:217-226.

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Students were classified as current smokers if they reported smoking cigarettes on any of the 30 days before the survey. The prevalence of smoking by student demographics and household characteristics is presented in Table 1.

Table 1. Association between student smoking status and demographic, family, and peer variables

		<u>percent smokers</u>	<u>chi square p value</u>
Sex			
	Male	16%	.01
	Female	18%	
Grade			
	8th	10%	.0001
	10th	18%	
	12th	24%	
Race			
	White	15%	.0001
	American Indian	38%	
	All others	20%	
Highest education for either parent			
	High school or less	23%	.0001
	Some college or BA	15%	
	More than BA	11%	
Parents' opinion of child smoking			
	Disapprove	13%	.0001
	Don't disapprove	57%	
Family rules about tobacco			
	Has rules	14%	.0001
	No rules	34%	
Smokers in the home			
	Other smokers	30%	.0001
	No other smokers	14%	
Siblings have ever smoked			
	Sibling smokers	57%	.0001
	No sibling smokers	13%	
Student believes it is wrong to smoke			
	Wrong or very wrong	6%	.0001
	Not wrong	52%	
Student believes it is cool to smoke			
	Cool	39%	.0001
	Not cool	13%	
Student has friends who smoke			
	Have smoking friends	35%	.0001
	No smoking friends	2%	

Most of the familial and peer factors we examined also varied significantly by sex, grade, race, and parental educational attainment. In order to evaluate the association between student smoking and familial factors, we controlled for those variables that were significantly associated with both smoking and familial factors using multiple logistic regression techniques. Multiple logistic regression can

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be used to look at the effects of parental disapproval of smoking, family rules about smoking, the presence of other smokers in the home, and sibling smoking while controlling for other significant correlates of smoking such as sex, grade, race, and parental educational attainment. Each Odds Ratio in the model can be interpreted as, "Holding the effect of all the other variables constant at the reference level, what is the effect of _____ on the odds that a child smokes?" For each independent variable except sex, the reference category is the one associated with the lowest likelihood of smoking. For sex, the reference category is male; an Odds Ratio less than 1.00 indicates that girls were less likely than boys to be smokers.

Table 2. Multivariate Logistic Model of Likelihood of Smoking by Family Factors

	<u>Odds Ratio for Smoking</u>	<u>95% Confidence Interval</u>
Parents' opinion of child smoking		
Disapprove	1.00§	
Don't disapprove	4.85	(4.20, 5.59)
Family rules about tobacco		
Has rules	1.00	
No rules	1.67	(1.49, 1.92)
Smokers in the home		
Other smokers	1.59	(1.40, 1.81)
No other smokers	1.00	
Siblings have ever smoked		
Sibling smokers	3.01	(2.70, 3.36)
No sibling smokers	1.00	
Parental education		
High school or less	1.33	(1.19, 1.48)
College	1.00	
Race		
White	1.00	
Non-white	1.77	(1.56, 2.02)
Grade		
8th or 10th	1.00	
12th	1.53	(1.37, 1.70)
Sex		
Male	1.00	
Female	0.94	(0.85, 1.04)

§ Reference category

The multivariate model (Table 2) is consistent with the univariate associations between student smoking and risk factors. The effect of parental disapproval on the odds of smoking was actually enhanced by controlling for other known predictors of smoking and for potential interactions or confounding. Conversely, the effects of parental educational attainment, other smokers in the home, siblings who smoke, and race were somewhat reduced in the full model, again as a result of taking into account confounding among the independent variables. The modest reduction in the predictive value of grade in the multivariate model, and the loss of statistical significance associated with sex, are attributable to simultaneous adjustment for all factors in the model.

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Taking all other factors in the model into account, students who perceived that their parents did **not disapprove** of them smoking were almost five times **more likely** (Odds Ratio = 4.85) to be current smokers than students who perceived parental disapproval. In addition, students whose siblings smoked were three times more likely (OR = 3.01) to smoke than those whose siblings never smoked or those who had no siblings. Students who reported having no family rules about tobacco and those who lived with other smokers were also more likely to smoke. Nevertheless, the strongest predictor of students being current smokers was the perception of parental attitude toward children smoking.

Students own beliefs and peer factors were also associated with student smoking behavior. Students who perceived smoking would make them seem cool were almost twice as likely (OR = 1.84) to smoke as those who did not perceive smoking as cool (Table 3). Students who did not believe it was wrong for someone their age to smoke were eight times more likely (OR = 8.06) to smoke than students who believed it was wrong. Students who reported that one or more of their four best friends smoked were more than 10 times more likely (OR = 10.49) to smoke than those who had no friends who smoked.

Table 3. Multivariate Logistic Model of Likelihood of Smoking by Peer Factors

	<u>Odds Ratio for Smoking</u>	<u>95% Confidence Interval</u>
Cool to smoke		
Not cool	1.00§	
Cool	1.84	(1.61, 2.09)
Wrong to smoke		
Wrong or very wrong	1.00	
Not wrong	8.06	(7.18, 9.05)
Friends smoke		
No smoking friends	1.00	
Has smoking friends	10.49	(8.91, 12.36)
Race		
White	1.00	
Non-white	1.77	(1.54, 2.02)
Grade		
8th or 10th	1.00	
12th	1.16	(1.03, 1.31)
Sex		
Male	1.00	
Female	0.90	(0.81, 1.01)

§ Reference category

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Student beliefs about smoking and having friends who smoked were related to parental disapproval of children smoking and household rules about tobacco use (Table 4).

Table 4. Association between student beliefs about smoking and parental disapproval of smoking

	<u>percent</u>	<u>chi square p value</u>
Student believes it is wrong to smoke		
Parents' opinion of child smoking		
Disapprove	81%	.0001
Don't disapprove	29%	
Student believes it is cool to smoke		
Parents' opinion of child smoking		
Disapprove	14%	.0001
Don't disapprove	30%	
Student has friends who smoke		
Parents' opinion of child smoking		
Disapprove	41%	.0001
Don't disapprove	78%	

Students who perceived that their parents disapproved of smoking were more than six times more likely ($OR = 6.71$) to believe it was wrong for them to smoke, and those who reported that their family had rules about tobacco use were more than twice as likely ($OR = 2.32$) to believe that it was wrong for them to smoke (Table 5). Students who perceived that their parents did not disapprove of smoking were more than twice as likely ($OR = 2.30$) to believe that smoking would make them seem cool and more than three times more likely ($OR = 3.38$) to have close friends who smoked. Students who reported that their households had no rules about tobacco use were also more likely to believe that smoking was cool ($OR = 1.30$) and to have friends who smoked ($OR = 1.93$).

Table 5. Multivariate Logistic Model of Likelihood of Peer Factors by Family Factors

	Odds Ratio for Peer Factors (95% confidence interval)		
	Wrong to smoke	Cool to smoke	Friends smoke
Parents' opinion of child smoking			
Disapprove	6.71 (5.81, 7.34)	1.00 [§]	1.00
Don't disapprove	1.00	2.30 (1.98, 2.67)	3.38 (2.92, 3.93)
Family tobacco rules			
Has rules	2.32 (2.08, 2.60)	1.00	1.00
No rules	1.00	1.30 (1.14, 1.48)	1.93 (1.74, 2.15)
Race			
White	1.00	1.00	1.00
Non-white	1.50 (1.33, 1.69)	1.44 (1.27, 1.63)	1.92 (1.73, 2.13)
Grade			
8th or 10th	1.00	1.00	1.00
12th	2.26 (2.07, 2.48)	0.82 (0.76, 0.94)	1.69 (1.56, 1.83)
Sex			
Male	1.00	1.00	1.00
Female	0.97 (0.89, 1.07)	0.75 (0.69, 0.84)	0.91 (0.85, 0.98)

§ Reference category

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Summary and Conclusion

Several variables were strong correlates of student smoking in this analysis: lack of perceived parental disapproval of children smoking, sibling smoking, the student's own belief that it was not wrong to smoke, and having friends who smoked. In addition, parental disapproval of children smoking was very strongly associated with a student's belief that smoking was wrong, and also strongly associated with a student's likelihood of having friends who smoked. These results suggest a complex relationship among parents' and children's beliefs about tobacco, and between beliefs and tobacco use among the respondents.

These data are cross-sectional and self-reported. We cannot assert that parental disapproval and family rules prevented student smoking or mediated student beliefs about tobacco or their choice of friends. We do not know whether the students' perceptions about their parents' attitudes were accurate. The results do, however, suggest a relationship between what students report their parents feel about youth smoking, their own beliefs about tobacco, and their likelihood of being current smokers. Furthermore, these results are consistent with previous, longitudinal studies that found parental disapproval and parental and sibling smoking predicted the risk of children becoming smokers.

These results from a recent Montana survey, in combination with previous longitudinal studies elsewhere, suggest that family norms and rules have a significant effect on students' attitudes about smoking and the likelihood of student smoking.

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